

## REMARKS

Entry of this amendment and reconsideration and allowance of this application, as amended, are respectfully requested.

The claims are amended to correct the 35 USC 112 informalities noted by the Examiner.

Applicant appreciates the Examiner's indication of allowable subject matter in claim 35. This claim has been amended into independent form.

Claims 15-16 were rejected under 35 U.S.C. § 102(b) as being anticipated by Isao (JP-04-093080). This ground of rejection is respectfully traversed.

According to the Examiner: "Isao teaches a method for forming a semiconductor device comprising at least the steps of: ...implanting impurity ions to form source/drain extension regions 23 (Fig. 4C)..."

Amended claim 15 calls for a method of manufacturing a semiconductor device comprising: ...implanting impurity ions into at least a bottom surface of the trench by using an entire of the gate as a mask to form source/drain extension regions..."

Isao does not use the *entire gate* as a mask for the impurity ion implantation. Specifically, the thick portion of the gate electrode 12A, 12A' is used as a mask for the impurity ion implantation, but the thin extending end portion of the gate electrode 12A, 12A' is not used as a mask for the impurity ion implantation. Impurity ions pass through the thin end portion of the gate electrode and are implanted into the semiconductor substrate. Thus, Isao does not disclose the claimed feature in proposed claim 15 of "implanting impurity ions into at least a bottom surface of the trench by using an entire of the gate as a mask to form source/drain extension regions", and thus, Isao does not anticipate proposed claim 15 and its dependent claim 16.

Claims 15-16 were rejected under 35 U.S.C. § 102(b) as being anticipated by Ahn et al. (USP 5,342,796). This ground of rejection is respectfully traversed.

The Examiner states that “Ahn et al. teaches a method for forming a semiconductor device comprising at least the steps of: ...implanting impurity ions to form source/drain extension regions 11 (Fig. 8)...”.

Amended claim 15 calls for a method of manufacturing a semiconductor device comprising: ...patterning the gate material film to form a gate on a central portion between both sides of the trench on a source/drain side through the second insulating film, while providing an exposed bottom surface of the trench, on which the gate material film does not exist; implanting impurity ions into at least the exposed bottom surface of the trench by using an entire of the gate as a mask to form source/drain extension regions...”.

Ahn et al. discloses implanting impurity ions by using the gate as a mask to form source/drain extension regions 11. However, in Ahn et al., the gate electrode 9 is formed substantially on the entire of the trench, and thus no exposed bottom surface of the trench exists. Thus, in Ahn et al., the source/drain extension regions is formed substantially outside the bottom surface of the trench. Hence, Ahn et al. does not disclose the claimed feature in proposed claim 15 of “implanting impurity ions into at least the exposed bottom surface of the trench by using entire of the gate as a mask to form source/drain extension regions”, and thus, Ahn et al. does not anticipate proposed claim 15 and its dependent claim 16.

Claim 17 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Isao (JP 04-093080) or Ahn et al. (U.S. Patent 5,342,796) taken with Jeuch et al. (U.S. Patent 4,939,100) and Lee et al. (U.S. Patent 5,583,064).

However, Jeuch et al., the gate 62 (Fig. 5H) is formed in the entire of the contact hole 51 (Fig. 5C).

In Lee et al., the trench is formed after the gate 68 is formed (Fig. 6H). This step order is opposite to that recited in claim 15. Thus, the combination of the cited reference does not suggest our claim 17.

Claims 18-19 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Isao (JP 04 093080) taken with Bronner et al. (U.S. Patent 5,362,663).

However, as described with regard to the rejection of the base claims 15 and 16, Isao does not use the entire gate as a mask for the impurity ion implantation. Impurity ions are passed through the thin end portion of the gate electrode and implanted into the semiconductor substrate. Thus, Isao does not disclose the claimed feature in proposed claim 15 of "implanting impurity ions into at least the exposed bottom surface of the trench by using entire of the mask to form source/drain extension regions". Hence, the combination of Isao and Bronner et al. does not make claims 18-19 obvious.

Claim 20 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Isao (JP 04 093080) or Ahn et al. (U.S. Patent 5,342,796) taken with Rodder et al. (U.S. Patent 5,079,180).

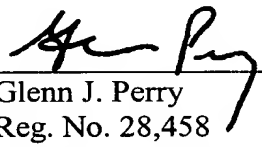
However, as described with regard to the rejection of the base claims 15 and 16, Isao does not use the entire gate as a mask for the impurity ion implantation. Impurity ions are passed through the thin end portion of the gate electrode and implanted into the semiconductor substrate. Thus, Isao does not disclose the claimed feature in proposed claim 15 of "implanting impurity ions into at least the exposed bottom surface of the trench by using entire of the gate as a mask to form source/drain extension regions".

Furthermore, as described with regard to the rejection of the base claims 15 and 16, in Ahn, the gate electrode 9 is formed substantially on the entire of the trench and thus no exposed bottom surface of the trench exists. In Ahn, the source/drain extension regions are

formed outside the bottom surface of the trench. Hence, the Ahn does not disclose the claimed feature in proposed claim 15 of "implanting impurity ions into at least the exposed bottom surface of the trench by using entire of the gate as a mask to form source/drain extension regions." Hence, the combination of these references does not make claim 20 obvious.

All outstanding matters having been addressed, it is respectfully submitted that the present application is in a condition for allowance and a Notice to that effect is earnestly solicited.

Respectfully submitted,

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